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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,222	11/21/2003	Adel Jilani	200313046	3182

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EXAMINER	
STULTZ, JESSICA T	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

BV

Office Action Summary	Application No.	Applicant(s)	
	10/719,222	JILANI ET AL.	
	Examiner	Art Unit	
	Jessica T. Stultz	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24,31-40 and 47-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-22,24 and 47-53* is/are allowed.

6)☒ Claim(s) *31,32,34-36 and 40* is/are rejected.

7)☒ Claim(s) *23,33 and 37-39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 23 is objected to because of the following informalities: claim 23, line 4, "said correspondingmicro-mirror" should be "said corresponding micro-mirror". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 31-32, 35-36, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Pan.

Regarding claim 31, Pan discloses a spatial light modulation device (Sections 35-41, wherein the spatial light modulator is shown in Figures 1a-b, 2-4) comprising: a micro-mirror (Sections 35-41, wherein the micro-mirror is "102", Figures 1a-b, 2-4); and a pliant flexure (Sections 35-41, wherein the pliant flexure is "106", Figures 1a-b, 2-4) supporting the micro-mirror (Sections 35-41, wherein the flexure "106" supports micro-mirror "102", Figures 1a-b, 2-4); the flexure having a bias (Section 41, wherein the flexure exhibits a bias when a voltage is applied, Figures 1a-b, 2-4); wherein the flexure stores energy due to the bias in response to any re-positioning of the micro-mirror array from a default orientation (Section 41, wherein energy is

stored in an elastic strain within the flexure "106" during re-positioning of the mirror "102", Figures 1a-b, 2-4), wherein the flexure releases the stored energy to drive movement of the micro-mirror when a force against the bias is relaxed (Sections 41 and 49, wherein the energy is converted to kinetic energy to move the mirror, Figures 1a-b, 2-4).

Regarding claim 32, Pan further discloses that the flexure holds the micro-mirror in the default orientation according to the bias when the flexure is not driven (Section 41, wherein the mirror remains in the default orientation without a voltage applied).

Regarding claim 35, Pan further discloses a set of electrodes for electrostatically driving the pliant flexure to controllably orient the micro-mirror (Sections 40-41, wherein electrodes "221" and "303" drive the flexure "106", Figures 1a-b, 2-4).

Regarding claim 36, Pan further discloses drive circuitry for driving the flexure to orient the micro-mirror (Sections 35-43, wherein the drive circuitry comprises bias voltages and electrodes "221" and "303", Figures 1a-b, 2-4).

Regarding claim 40, Pan further discloses a device comprising a plurality of micro-mirrors in an array (Sections 335-43, wherein the mirrors "102" are formed in an array, Figure 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pan applied to independent claims 31 as shown above, in view of Culp.

Regarding claim 34, Pan discloses a spatial light modulation device comprising a micro-mirror device as shown above, but does not specifically disclose that the pliant flexure comprises a piezoelectric element configured to orient the micro-mirror. Culp teaches of a mirror which is oriented by springs driven by piezoelectric elements (Column 2, line 5-Column 3, line 21, wherein the piezoelectric elements "14, 16, 18, 20, and 22"/"64" drive spring means "32"/"56" which orient mirror "28"/"54", Figures 1-3) for the purpose of imparting energy and detecting energy and to supply signal as to the force or magnitude or direction of impact of the mirror and to thrust the mirror in the selected positions (Column 3, lines 14-21). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the micro-mirror device of Pan to further include the pliant flexure comprising a piezoelectric element configured to orient the corresponding micro-mirror since Culp teaches of a mirror which is oriented by springs driven by piezoelectric elements for the purpose of imparting energy and detecting energy and to supply signal as to the force or magnitude or direction of impact of the mirror and to thrust the mirror in the selected positions.

Response to Arguments

Applicant's arguments with respect to claims 31-32, 34-36, and 40 have been considered but are moot in view of the new ground(s) of rejection in view of Pan as shown above.

Applicant's arguments, see Remarks, filed September 29, 2005, with respect to claims 1-24 and 47-52 have been fully considered and are persuasive. The rejections of claims 1-24 and 47-52 have been withdrawn.

Allowable Subject Matter

Claims 1-24 and 47-53 are allowed.

Claims 33 and 37-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowable subject matter: none of the prior art alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103.

Specifically regarding independent claim 1, none of the prior art alone or in combination disclose or teach of a micro-mirror device supported by a flexure spring wherein the flexure spring is configured to store potential energy during movement and to release kinetic energy to drive movement, specifically wherein the flexure spring has supports thereon attached to the micro-mirror and that space the micro-mirror from the flexure spring.

Specifically regarding independent claim 13, none of the prior art alone or in combination disclose or teach of an array of micro-mirrors, wherein each micro-mirror is supported by a flexure spring wherein the flexure spring is configured to store potential energy during movement and to release kinetic energy to drive movement, specifically wherein the flexure spring has supports thereon attached to the micro-mirror.

Specifically regarding claims 33 and 37-39, none of the prior art alone or in combination disclose or teach of an array of micro-mirrors, wherein each micro-mirror is supported by a flexure spring wherein the flexure spring is configured to store potential energy during

movement and to release kinetic energy to drive movement, specifically wherein the flexure spring has supports for supporting the micro-mirror.

Specifically regarding independent claim 47, none of the prior art alone or in combination disclose or teach of a micro-mirror device supported by a flexure spring wherein the flexure spring is configured to store potential energy during movement and to release kinetic energy to drive movement, specifically wherein the micro-mirror is supported on arms of the flexure spring, with supports connected between the arms and opposite corners of the micro-mirror and wherein the flexure spring comprises a plurality of flexures disposed side-by-side and substantially parallel to each other.

Specifically regarding independent claim 53, none of the prior art alone or in combination disclose or teach of a micro-mirror device supported by a flexure spring wherein the flexure spring is configured to store potential energy during movement and to release kinetic energy to drive movement, specifically wherein the micro-mirror is supported on arms of the flexure spring, with supports connected between the arms and opposite corners of the micro-mirror, the supports spacing the micro-mirror from the arms of the flexure spring, and wherein the flexure spring comprises a plurality of flexures disposed substantially parallel to each other.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica T. Stultz whose telephone number is (571) 272-2339. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jessica Stultz
Patent Examiner
AU 2873
December 8, 2005

JORDAN SCHWARTZ
PRIMARY EXAMINER